Operator DYNA_LINE

1 Goal

DYNA_LINE is the unified operator allowing to carry out calculation of a transitory or harmonic answer on physical or generalized basis. It can also treat the non-linearities located for calculations of transitory answer, the interaction ground-structure or the interaction fluid-structure on generalized basis.

Interest of the operator DYNA_LINE, compared to the operators DYNA_VIBRA or CALC_MISS, is that the user does not need to be concerned with stages of assembly of the matrices. The construction of a relevant base of projection for the resolution of the problem on generalized basis is automatically carried out by the operator starting from well informed information.

The produced concept depends on the type of calculation carried out (dyna_trans, dyna_harmo).

2 Syntax

```
nom_concept [dyna_line_prod] = DYNA_LINE    (

      ♦  TYPE_CALCUL =    / 'HARM',
                          / 'TRAN',

      ♦  BASE_CALCUL =    / 'PHYS',
                          / 'GENE',

# Keywords concerning the setting in physical data of the model finite elements :
      ♦  MODEL    = Mo,                              [model]
      ◊  CHAM_MATER = chmat,                            [cham_mater]
      ◊  CARA_ELEM  = carac,                            [cara_elem]
      ♦  LOAD       = load,                          [char_meca]
                                                     [char_cine_meca]

# Recovery of the concepts on generalized basis:
    # If BASE_CALCUL == 'GENE'
       ◊ BASE_RESU =  base_resu,                      [mode_meca]
      ◊  RESU_GENE =  resu_gene,                      [tran_gene, harm_gene]

# Keywords concerning the calculation of base generalized:
    # If BASE_CALCUL == 'GENE' and that one does not treat the YEWS
      ◊  ENRI_STAT     =  / 'YES',                    [DEFECT]
                          / 'NOT',

    # If ENRI_STAT == 'YES'
         ◊  ORTHO         =  / 'NOT',                 [DEFECT]
                             / 'YES',

         ◊  FREQ_COUP_STAT   = fc_stat                [R]

# Keywords concerning increments
      ◊  BANDE_ANALYSE = [f_min, f_max],             [l_I]
      ◊  PCENT_COUP    = / pcent_coup,               [R]
                         / 90.

# Keywords concerning increments if harmonic calculation :
    # If TYPE_CALCUL == 'HARM'
      ◊  / FREQ       =  freq,                       [l_R]
         / LIST_FREQ  =  list_freq ,                 [listr8]

# Keywords concerning increments if transitory calculation :
    # If TYPE_CALCUL == 'TRAN'
           ◊  SCHEMA_TEMPS = _F (to see the document [U4.53.03]),
           ♦  INCREMENT =_F (
                      ◊  INST_INIT = Ti,            [R]
                      ◊  NOT       = dt,            [R]
                      ♦  INST_FIN  = tf,            [R]
                         ),
            ◊ ETAT_INIT = _F (
                      ◊  DEPL = C,                  [cham_no]
                      ◊  QUICKLY = vo,                    [cham_no]
                         ),
           ◊  FILING = _F (to see the document [U4.53.03]),

# Damping
```

```
      ◊  DAMPING = _F (
                 ♦  TYPE_AMOR =  / 'RAYLEIGH',
                                 / 'HYST',
                                 / 'MODAL',
                                 ),
                 # If 'MODAL' TYPE_AMOR ==
                    ♦  AMOR_REDUIT =l_amor ,          [l_R]


# Excitation
      ◊  EXCIT =   F (◊  TYPE_APPUI = / 'MONO',
                                      / 'MULTI',
                                 ),
                    ♦  /  FONC_MULT =  F,          [function]
                                                   [tablecloth]
                                                   [formula]
                       /  COEF_MULT =  has,           [R]
                       /  FONC_MULT_C  =  hci,     [fonction_C]
                                                   [formule_C]
                       /  COEF_MULT_C  =  aci,     [C]
                                                   [formula]
                    ◊  PHAS_DEG  =  /  0. ,           [DEFECT]
                                    /  phi,        [R]
                    ◊  PUIS_PULS =  /  0,          [DEFECT]
                                    /  nor,           [Is]

   # Without TYPE_APPUI
                    ♦  LOAD = load,             [char_meca]

# Operands and keywords specific to the seismic analysis
   # With TYPE_APPUI
                    ♦  DIRECTION = (dx, Dy, dz, drx, dry Martini, drz),  [l_R]
                    ◊  /   GROUP_NO  =lgrno,     [l_groupe_no]
                    ◊  ACCE = ac,                [function]
                                                 [tablecloth]
                                                 [formula]
                    ◊  QUICKLY = VI,                [function]
                                                 [tablecloth]
                                                 [formula]
                    ◊  DEPL = dp,                [function]
                                                 [tablecloth]
# Interaction ground-structure
      ◊  ISS       = 'YES',

   # If ISS == 'YES'

      ◊  VERSION_MISS =   /  'V6.7',               [DEFECT]
                          'V6.6',
                          'V6.5',
      ◊  CALC_IMPE_FORC =    / 'YES',              [DEFECT]
                             / 'NOT',
            ♦  GROUP_MA_INTERF  =  grma,           [grma]
            ♦  GROUP_NO_INTERF  =  grno,           [grno]
      ◊   TYPE_MODE   =      / 'Pseudonym',
                             / 'CRAIG_BAMPTON',    [DEFECT]
                             / 'INTERF',

      # If TYPE_MODE == 'INTERF'
       ♦  NB_MODE_INTERF = int                     [I]
```

```
# If CALC_IMPE_FORC == 'NOT'
     ♦  UNITE_RESU_IMPE = uresimp              [I]
     ♦  UNITE_RESU_FORC = uresfor              [I]

# If CALC_IMPE_FORC == 'YES'
     ◊  UNITE_IMPR_ASTER = Uimpast             [I]
     ◊  UNITE_RESU_IMPE = uresimp              [I]
     ◊  UNITE_RESU_FORC = uresfor              [I]
     ♦  / TABLE_SOL = ( to see the document [U7.03.12] ),
        / MATER_SOL = (to see the document [U7.03.12]),
     ◊  PARAMETER = _F ( to see the document [ U7.03.12 ] ),

# If TYPE_CALCUL == 'TRAN'
    ♦  /   |  ACCE_X = acce_x                  [fonction_c]
           |  ACCE_Y = acce_y                  [fonction_c]
           |  ACCE_Z = acce_z                  [fonction_c]
       /   |  DEPL_X = depl_x                  [fonction_c]
           |  DEPL_Y = depl_y                  [fonction_c]
           |  DEPL_Z = depl_z                  [fonction_c]
```

Behaviors non-linésurfaces

```
     ◊  BEHAVIOR =   _F (to see the document [U4.53.03]),
```

Interaction fluid-structure

```
     ◊   YEWS        = 'YES',

# If YEWS == 'YES'
     ◊  FORC_AJOU        = 'YES',
     ♦  GROUP_MA_INTERF  = interf,             [gr_ma]
     ♦  GROUP_MA_FLUIDE  = fluid,              [gr_ma]
     ♦  MODELISATION_FLU =  / '3D'
                            / 'HULL'
     ♦  RHO_FLUIDE = _F (      ♦  RHO    =  rho,          [R]
                            ♦  / ALL      =  'YES ',
                               / GROUP_MA =  grma,    [gr_ma]
                            ),
     ♦  PRESSION_FLU_IMPO = _F (
                            ♦  PRESS_FLUIDE =  near     [R]
                            ♦  GROUP_NO  =  grno        [gr_no]
                            ),
```

Solveur

```
     ◊  SOLVEUR          = _F ( to see the document [U4.50.01] ),
```

Structure of data produced:

TYPE_CALCUL == 'TRAN'	dyna_trans
TYPE_CALCUL == 'HARM'	dyna_harmo

Contents

3 Operands of indirection

3.1 TYPE_CALCUL

This keyword makes it possible to make the choice between a calculation transitoire (TYPE_CALCUL=' TRAN') and a harmonic calculation (TYPE_CALCUL=' HARM').

3.2 BASE_CALCUL

This keyword makes it possible to make the choice between a calculation on physical basis (BASE_CALCUL=' PHYS') and a calculation on generalized basis (BASE_CALCUL=' GENE').

4 Operands commun runS with any type of calculation

The operands following, commun runs with any type of calculation, make it possible to define the model finite elements.

4.1 MODEL

♦ MODEL = Mo, [model]

The physical model used for the calculation of dynamics defines

4.2 CHAM_MATER

◊ CHAM_MATER = chmat, [cham_mater]

Field material used for calculation.

4.3 CARA_ELEM

◊ CARA_ELEM = carac, [cara_elem]

Geometrical characteristics and elementary used for calculation.

4.4 LOAD

♦ LOAD = load, [Char_meca]

Loading of the conditions of Dirichlet allowing to block the structure.

5 Additional concepts of exit in generalized base

The structure of data produced by the operator DYNA_LINE is always restored on physical basis, including in the case of a calculation on generalized basis. The user thus does not need in theory to recover the base nor the generalized result having been used for calculation. However, these elements can prove to be useful for certain advanced postprocessings.

5.1 BASE_RESU

◊ BASE_RESU = base_resu, [mode_meca]

Allows to recover the base of calculation optionally built by the operator and who was used for dynamic calculation on generalized basis. The concept at exit east of the type [mode_meca].

5.2 RESU_GENE

◊ RESU_GENE = resu_gene, [tran_gene]

The operand RESU_GENE allows to optionally recover the result on basis generalized. The concept at exit east of the type [tran_gene, harm_gene] according to the type of calculation (TYPE_CALCUL).

6 Calculation of static enrichment

6.1 ENRI_STAT

◊ ENRI_STAT = / 'YES', [DEFECT]
/ 'NOT',

In the case of a calculation on basis generalized, a static correction is by default installation *via* the calculation of the static modes, added to the modal base.
Static modes are calculated for each affected loading under the keyword factor EXCIT (see §9), according to strategies dependent on the types of loading. Static modes are also calculated for the nonlinear behaviors affected under keyword factor BEHAVIOR (see §11.1).
The static modes are then assembled with the dynamic modes to form the generalized base of calculation.
The keyword ENRI_STAT in the case of a calculation with interaction fluid-structure is not usable (IFS='YES') (see §12).

6.2 ORTHO

◊ ORTHO = / 'NOT', [DEFECT]
/ 'YES',

The orthogonalisation of the assembled base of the dynamic modes and static modes allows. The orthogonalisation is carried out using a problem with the eigenvalues made up by the matrices of rigidity and mass projected on this assembled basis.

6.3 FREQ_COUP_STAT

◊ FREQ_COUP_STAT = fc_stat [R]

Cut-off frequency (expressed in Hz) used for the modal analysis allowing the orthogonalisation. If the keyword FREQ_COUP_STAT is defined by the user, no cut is not taken into account.

7 Definition of the beach of calculation and the increments

7.1 Operands BANDE_ANALYSE, PCENT_COUP

7.1.1 Keyword BANDE_ANALYSE

◊ BANDE_ANALYSE = [f_min, f_max],

Allows to define the waveband in whom one wishes to make the dynamic analysis. In the case of a calculation on generalized basis, the values of the band are used for the calculation of the dynamic modes. This keyword can contain only one value, in this case this value will correspond to the maximum frequency f_max, the minimal frequency f_min being imposedE to zero.

If the keyword BANDE_ANALYSE is not informed, in the case of a transitory calculation, the minimal frequency f_min is imposed on zero, the maximum frequency f_max will be calculated automatically starting from the cut-off frequency of the entry signals.

7.1.2 Keyword PCENT_COUP

```
◊ PCENT_COUP     = / pcent_coup,                [R]
                   / 90.
```

The cut-off frequency of an entry signal is calculated so as to contain PCENT_COUP % of the energy of the entry signal. The value of the keyword PCENT_COUP must be ranging between 80 and 100.
The cut-off frequency corresponds to the maximum value of the cut-off frequencies of each signal. Then the maximum frequency f_max is imposed on twice the cut-off frequency.

7.2 Operands FREQ, LIST_FREQ

```
◊ / FREQ       =  freq,                       [l_R]
  / LIST_FREQ  =  list_freq ,                 [listr8]
```

In the harmonic case, these keywords make it possible to define the frequencies for which the answer of dynamics will be calculated.

7.3 Operands SCHEMA_TEMPS, INCREMENT, ETAT_INIT, FILING

The following keywords are useful in the case of a transitory calculation.

7.3.1 Keyword factor SCHEMA_TEMPS

◊ SCHEMA_TEMPS = _F (…)

This keyword factor makes it possible to in the case of define the parameters concerning the diagram of temporal integration a transitory calculation. One will be able to refer to Doc.umentation of DYNA_VIBRA [U4.53.03] for more information concerning the significance of the keywords simple used.

Let us note that by default, the operator DYNA_LINE use it diagram DEVOGE contrary to DYNA_VIBRA who uses by default the SCHémy DIFF_CENTRE.

7.3.2 Keyword factor INCREMENT

```
♦ INCREMENT =_F (
            ◊  INST_INIT =  Ti,          [R]
            ◊  NOT       = dt,           [R]
```

♦ INST_FIN= tf, [R]
),

This keyword factor makes it possible to define the increments of calculation in the case of a transitory calculation. One will be able to refer to Doc.umentation of DYNA_VIBRA [U4.53.03] for more information concerning the significance of keywords simple used.

Let us note that contrary to the operator DYNA_VIBRA, it is not obligatory to specify the keyword simple NOT defining the step of calculation. In this case, the step of calculation is calculated automatically. If the keyword BANDE_ANALYSE is present (see § 7.1.1), then the step is calculated as follows:

$$\Delta t = \frac{1}{5 f_{max}}$$

If not, the step is calculated directly starting from the cut-off frequency (see §7.1.2), as follows:

$$\Delta t = \frac{1}{5 f_c}$$

7.3.3 Mot-key factor ETAT_INIT

◊ ETAT_INIT = _F (…)

This keyword factor makes it possible to define an initial state. One will be able to refer to Doc.umentation of DYNA_VIBRA [U4.53.03] for more information concerning the significance of the keywords simple used.

Let us note that in the case of a calculation on generalized basis, contrary to what is envisaged in the setting in dataS of DYNA_VIBRA, the user cannot provide the vectors projected on the generalized basis. It is necessary then to provide, in the same manner that for a calculation on physical basis, the fields with nodes on physical basis, which will be automatically projected by the operator on the basis generalized if need be.

7.3.4 Mot-key factor FILING

◊ FILING = _F (…)

This keyword FCtor allows contrôLer moments of filing. One will be able to refer to Doc.umentation of DYNA_VIBRA [U4.53.03] for more information concerning the significance of the keywords simple used.

8 Definition of damping

8.1 Keyword factor DAMPING

◊ DAMPING = _F (…)

Keyword factor allowing to introduce various types of damping.

8.1.1 TYPE_AMOR = 'RAYLEIGH'

♦ TYPE_AMOR = 'RAYLEIGH',

This option makes it possible to calculate the matrix of damping of Rayleigh while being based on the parameters (AMOR_ALPHA, AMOR_BETA) materials affected in CHAM_MATER (see §4.2) and of discrete of type (A_T*) defined in CARA_ELEM (see §4.3).

8.1.2 TYPE_AMOR = 'HYST'

♦ TYPE_AMOR = 'HYST',

This option is utilsée in the case of a harmonic calculation (TYPE_CALCUL == 'HARM'). It makes it possible to calculate the matrix of damping hystérétick while basing itself on the parameter (AMOR_HYST) materials affected in CHAM_MATER (see § 4.2) and of discrete of type (A_T*) defined in CARA_ELEM (see § 4.3).

8.1.3 TYPE_AMOR = 'MODAL'

♦ TYPE_AMOR = 'MODAL',

In the case of a calculation on generalized basis, it is sometimes simpler and relevant to define modal depreciation. In this case, it is necessary to specify in AMOR_REDUIT reduced depreciation (percentages of damping criticizes) correspondent with each mode of the system in the form of list of realities.

♦ AMOR_REDUIT =l_amor , [l_R]

If the number of reduced depreciation given is lower than the number of basic vectors used in the modal base, depreciation of the additional vectors is taken equal to the last damping of the list l_amor.

9 Keyword factor EXCIT

◊ EXCIT = F (…)

This keyword factor makes it possible to define in each occurrence a load. The operands have a meaning equivalent to those described in the document [U4.54.03] with the difference that, for the operator DYNA_LINE, it is not necessary to provide all information concerning the second members, who are automatically calculated by the operator.

9.1 Keyword LOAD

Loading applied to the structure, beforehand definite starting from the operator AFFE_CHAR_MECA. The keyword LOAD must appear only in occurrence of the keyword factor if the keyword TYPE_APPUI is not present.

9.2 Keywords TYPE_APPUI, DIRECTION, GROUP_NO

Keywords used in the case of seismic loadings, one will be able to refer to the document [U4.63.01] for more details. The keyword TYPE_APPUI must appear only in the occurRin it of the keyword factor if the keyword LOAD is not present.

9.2.1 TYPE_APPUI = 'MONO'

◊ TYPE_APPUI = 'MONO'

The structure is uniformly excited in all the supports. It is necessary to specify the direction of excitation *via* the keyword DIRECTION.

9.2.2 TYPE_APPUI = 'MULTI'

◊ TYPE_APPUI = 'MULTI'

The excitation is applied to a part only of the supports. It is necessary to specify the direction of excitation *via* the keyword DIRECTION as well as the nodes concernedS *via* the keyword GROUP_NO.

9.2.3 Keyword DIRECTION

◊ DIRECTION = (dx, Dy, dz, drx, dry Martini, drz)

Component of a vector giving the direction of the earthquake in the total reference mark.

9.2.4 Keyword GROUP_NO

◊ GROUP_NO = g_noeu

List of the groups of nodes structure subjected to the excitation in the case with TYPE_APPUI. If TYPE_APPUI = 'MULTI' , it is obligatorily necessary to specify keyword GROUP_NO. If TYPE_APPUI = 'MONO', the keyword GROUP_NO is not not obligatory. Cependant, occurrences for keyword GROUP_NO for all the occur will have to be the same onesRin these of the keyword factor EXCIT .

9.3 Operands FONC_MULT , COEF_MULT , FONC_MULT_C , COEF_MULT_C , ACCE , QUICKLY , DEPL , PHAS_DEG , PUIS_PULS

Coefficient or multiplying function of the assembled vector. In the case transient, it is obligatorily necessary to provide a function of time. In the harmonic case, it is possible to provide a coefficient or a complex function depending on the frequency. See document [U4.53.03] for more details on the use of these keywords.

10 Interaction ground-structure

◊ ISS = 'YES',

Activation of the taking into account of the interaction ground-structure. In the case with interaction ground-structure, seismic calculation will use parameters calculated using MISS3D (*via* CALC_MISS).

10.1 Input-outputs of the calculation of ground

10.1.1 Keyword CALC_IMPE_FORC

◊ CALC_IMPE_FORC = / 'YES', [DEFECT]
/ 'NOT',

By default, the operator CALC_MISS is called for the first time by using the option FILE, which makes it possible to launch an execution of MISS3D and to recover of them the results in files, definite on logical unit.

The user can disable this stage while imposing CALC_IMPE_MISS = 'NOT' . It is then necessary in this case to define the logical units which correspond to already existing files.

10.1.2 Keywords UNITE_RESU_IMPE, UNITE_RESU_FORC

♦ UNITE_RESU_IMPE = uresimp [I]
♦ UNITE_RESU_FORC = uresfor [I]
◊ UNITE_RESU_FORC = uresfor [I]

These keywords make it possible to define the logical units associated with the impedances and equivalent seismic forces calculated per MISS3D.

In the case CALC_IMPE_FORC == 'NOT', these keywords are obligatory and correspond to files already exiStants which was generated before.

In the case CALC_IMPE_FORC == 'YES', these keyword are optional and allow to recover impedances and equivalent seismic forces calculated per MISS3D.

10.1.3 Keywords TABLE_SOL / MATER_SOL

♦ / TABLE_SOL = tabsol [table]
/ MATER_SOL = matsol

These keywords make it possible to define the stratification of ground used in calculation MISS3D.
One of these keywords must obligatorily be Définished if CALC_IMPE_FORC == 'YES'.
One will be able to refer to the document [U7.03.12] for more details concerning these keywords.

10.2 Interface ground-structure

10.2.1 Keyword VERSION_MISS

♦ VERSION_MISS = / 'V6.7', [DEFECT]
'V6.6',
'V6.5',

NRuméro version of MISS3D. The value by default corresponds to the version of MISS3D in exploitation.
Calculations MISS3D on large models (or with much of frequencies) can be long and expensive in memory. Fortunately Ccan be to them-here accelerated by activating one or two levels of parallelism. For more information one will be able to consult documentations [U2.06.07] and [U2.08.06].

10.2.2 WordSkeys GROUP_MA_INTERF, GROUP_NO_INTERF

♦ GROUP_MA_INTERF = grma, [grma]
♦ GROUP_NO_INTERF = grno, [grno]

GROUP_MA_INTERF corresponds to the group of meshs constituting the interface ground-structure.

GROUP_NO_INTERF corresponds to the group of nodes where the conditions of coupling are imposed. It is a question automatically of carrying out an embedding of the degrees of freedom of the nodes concerned to calculate the clean modes of the structure. The user should not add boundary conditions on this group like in the case of CALC_MISS.
In the case of a rigid foundation, the user must define one LIAISON_SOLIDE via the keyword LOAD and one GROUP_NO_INTERF containing a node corresponding to the center the foundation. In the case of a flexible foundation, no condition must be defined on GROUP_NO_INTERF who must contain all the nodes of the foundation.

10.2.3 Keywords TYPE_MODE / NB_MODE_INTERF

TYPE_MODE = / 'CRAIG_BAMPTON', [DEFECT]
/ 'INTERF',
/ 'Pseudonym',

Allows to define the method of calculating of the modes of interface associated with GROUP_MA_INTERF.
If TYPE_MODE == 'CRAIG_BAMPTON', all the modes of connection or constrained modes associated with the interface ground-structure are calculated.

If TYPE_MODE == 'INTERF', the user must specify the number of static modes to calculate via the keyword NB_MODE_INTERF.
If TYPE_MODE == 'Pseudonym', six rigid modes of body are calculated.

10.3 Parameters of the calculation of ground

◊ PARAMETER = _F (

This keyword factor makes it possible to enter the parameters of calculation MISS3D. One ref.will érera with the document [U7.03.12] for more details.

10.4 Operands ACCE_X, ACCE_Y, ACCE_Z, DEPL_X, DEPL_Y, DEPL_Z

In the case of a transitory calculation, these operands make it possible to provide them accélérogrammes with the assistance accelerations in one or several directions (ACCE_X, ACCE_Y, ACCE_Z) or the displacements imposed in one or more directions (DEPL_X, DEPL_Y, DEPL_Z).

11 Non-linear behaviors

11.1 Keyword factor BEHAVIOR

◊ BEHAVIOR = _F (…)

Keyword allowing to define different typeS non-linearities located in ChasS of a transitory calculation on basis generalized. One will refer with documentation [U4.53.03] for more details.

12 Interaction fluid-structure

◊ YEWS = 'YES',

Activation of the taking into account of the interaction fluid-structure. In this case, the interaction fluid-structure is taken into account via masses added with a dynamic calculation on generalized basis.

12.1 Taking into account of the added force

◊ FORC_AJOU = 'YES',

This keyword manage the taking into account of Forces added due to the seismic movement of training. One will be able to refer to the document [U4.66.03] for more details.

12.2 Fluid interface structure

♦ GROUP_MA_INTERF = interf, [gr_ma]

The group of mesh defines S of interface fluid-structure

12.3 Fluid model

12.3.1 MODELISATION_FLU

♦ MODELISATION_FLU = / '3D'
/ 'HULL'

Type of modeling for the fluid model

12.3.2 GROUP_MA_FLUIDE

♦ GROUP_MA_FLUIDE = fluid, [gr_ma]

Group of meshS on which rests the fluid model.

12.4 Properties of the fluid

♦ RHO_FLUIDE = _F (…)

Keyword factor where one affects the fluid material characteristics. If the density of the fluid varies on the fluid field, it is necessary to specify these various densities by several occurrences of the keyword factor RHO_FLUIDE.

12.4.1 Operand RHO

♦ RHO = rho, [R]

Density of the fluid.

12.4.2 Operands ALL / GROUP_MA

♦ / ALL = 'YES',
/ GROUP_MA = grma, [gr_ma]

Part of the fluid model on which density rho is applied.

12.5 Boundary conditions for the fluid problem

♦ PRESSION_FLU_IMPO = _F (…)

Keyword factor by which one specifies the boundary conditions of the fluid (of Dirichlet type).

12.5.1 Operand PRESS_FLUIDE

♦ PRESS_FLUIDE = near [R]

Keyword under which one specifies the value that one imposes on the hydrodynamic pressure (i.e. the disturbance of pressure created by the vibration of the structure) on the below given topological entity.

12.5.2 Operand GROUP_NO

♦ GROUP_NO = grno [gr_no]

Groupes of nodes where the pressure is imposed near on the fluid field.

13 Keyword factor SOLVEUR

One will refer to document [U4.50.01].

The use of the keyword SOLVEUR is not possible in the case of a calculation with interaction ground-structure.